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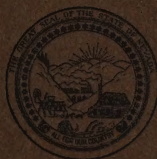
STATE OF NEVADA

FIFTH BIENNIAL REPORT

OF THE

DEPARTMENT OF HIGHWAYS

1925=1926



CARSON CITY, NEVADA
STATE PRINTING OFFICE—JOE FARNSWORTH, SUPERINTENDENT
1927



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PERSONNEL OF THE DEPARTMENT OF HIGHWAYS

ADMINISTRATION

JAMES M. LEONARD.....	Chairman Board of Directors
W. H. JOHNSTON.....	Director
GEO. A. CAMPBELL.....	Director
GEO. W. BORDEN.....	State Highway Engineer
HOWARD M. LOY.....	Assistant State Highway Engineer
H. D. MILLS.....	Secretary to the Board of Directors and Office Engineer

DEPARTMENTS AND DIVISIONS

P. L. BONEYSTEELE.....	Maintenance Engineer
E. C. POHL.....	Chief Accountant
T. J. COLLINS.....	Equipment Superintendent
W. T. HOLCOMB.....	Testing Engineer
R. WINDELE.....	Location Engineer
J. M. KANE.....	Chief Draftsman
NED MARTIN.....	Right-of-Way Engineer
C. C. BOYER.....	Division Engineer, Division No. 1
S. C. DURKEE.....	Division Engineer, Division No. 2
ART LOFORTH.....	Division Engineer, Division No. 3
J. L. VANDIVER.....	Division Engineer, Division No. 4

LETTER OF TRANSMITTAL

STATE OF NEVADA
DEPARTMENT OF HIGHWAYS

CARSON CITY, NEVADA, January 4, 1927.

HONORABLE FRED B. BALZAR, *Governor of the State of Nevada, Carson City, Nevada.*

DEAR SIR: We take pleasure in presenting herewith the fifth biennial report of the Department of Highways of the State of Nevada, as per statute requirement. This report covers the fiscal years 1925-1926, ending with November 30, 1926.

We have endeavored to set forth in this report, in as brief a form as possible, the general results of the department's activities during the past two years. We are also bringing to your attention certain recommendations which will affect the future of state highway construction in this State.

To yourself and to the members of your administration we extend our greetings and an offer of earnest cooperation in carrying out such policies as you feel are necessary for future highway development in the State of Nevada.

Respectfully,

JAMES M. LEONARD, *Chairman.*

W. H. JOHNSTON, *Director.*

GEO. A. CAMPBELL, *Director.*

FIFTH BIENNIAL REPORT OF THE DEPARTMENT OF HIGHWAYS

During the biennium covering the years 1925-1926 the Department of Highways of the State of Nevada has progressed with its highway construction and maintenance on a scale somewhat less than during the previous biennium, but it has at all times been endeavoring to complete the trans-State highways. The expenditure by the Department amounted to approximately \$2,275,000 per annum, and the mileage of constructed highways has been increased from 915.11 miles of various types, completed and under construction, to a total now complete and being constructed of 1,297.11 miles. Of the total mileage completed and under construction there are 1,239.99 miles that are completed State highway at this time; 1,072.67 miles are completed or under construction on the Federal aid seven per cent system; leaving 447.91 miles of the Federal aid seven per cent system still to be constructed, and 1,700 miles of the entire State Highway System still to be constructed.

The completed mileage of the State Highway System and mileage under construction is divided as follows:

<i>Type</i>	<i>Mileage</i>
Grading only	233.23
Grading and gravel, shale or crushed rock.....	980.68
Grading and asphalt macadam surface.....	24.01
Grading and asphalt concrete surface.....	1.96
Grading and cement concrete surface.....	47.07
Road oil-sand surface.....	10.16

The above construction is not centered at any particular point in the State, but is divided among the various routes of the State as follows:

Route No. 1 is complete or under construction from the Utah state line to Lovelock, and from Fernley to the California state line, with the exception of a small amount of paving necessary between Verdi and our western boundary.

Route No. 2 is complete or under construction from its junction with Route No. 1, near Fernley, to Ely and McGill, and to a point 7.01 miles north of McGill on a route leading to the Utah line. The route from the end of our present construction to connect with the Utah highway system is still undecided, but it is hoped that this matter will be settled at a very early date in order that Route 2 may secure an eastern outlet that will adequately take care of the travel which this construction has made possible.

Route No. 6, which extends from the Arizona line on the east, near Mesquite, through Las Vegas, to the California line, is now almost complete or under construction, leaving a gap near the California line of 12.08 miles, a short section near Las Vegas which will have to be straightened and surfaced, and a third short section of about $4\frac{1}{2}$ miles, east of Las Vegas, which has been partially graded and partially surfaced, but which will have to be brought to a higher standard due to the traffic which this road is receiving annually.

Route No. 4, from Ely to Tonopah, while not on the Federal aid system, has been given quite a little thought and care, so that during the summer time this is reputed to be one of the fastest roads in the Nation.

Through the assistance of Nye County and the cooperative efforts, particularly of the Board of County Commissioners and C. F. Wittenberg, a member of the Board of County Commissioners, this route has been improved across Nye County, and White Pine County is now making earnest efforts to complete this section near Ely, so that in the future we may look forward to a very excellent highway along Route 4 between Tonopah and Ely.

Routes Nos. 3 and 5 form one of our main arteries, leading from the southern part of the State to the capital and connecting with northern routes, and are handicapped by not being entirely upon the Federal aid system. This condition is entirely due to the limitation in mileage set by the Federal aid law—Federal aid can only be expended on this highway from Purdy, near the California line north of Reno, through Reno, Carson City, Yerington, Hawthorne, to Tonopah and Goldfield, and to the state line near Oasis, in California. The section on Route 5 from Goldfield to Las Vegas could not be included for Federal aid. As a result of this lack of Federal aid in the southern part of the State, and the inability of Mineral and Esmeralda Counties to provide highway funds in the counties, on account of their small valuation, this highway is at this time the most in need of future attention. It is possible, during the coming year, to complete the highway from Purdy, through Reno, Carson City, Minden, Yerington to Schurz, but under the present arrangement of funds it will be difficult to accomplish much in connecting Schurz to Tonopah, aside from what has already been constructed along Walker Lake.

Route No. 5 extends from Goldfield, through Beatty to Las Vegas and Searchlight, and ends near the Colorado River at the southern point of the State. This route from Las Vegas to Beatty is in fairly satisfactory condition for travel, a few places needing surfacing, which can be readily taken care of during the coming year. The route from Beatty to Goldfield, however, is partially in Esmeralda County, and the same trouble exists on Route No. 5 that exists on Route No. 3 in this same county.

Route No. 7, which extends from Ely, through Pioche, Caliente, to Route No. 6 east of Las Vegas, near Moapa, is rapidly being constructed from Caliente north to Ely. Arrangements have been made so that the travel will have a satisfactory highway at the close of the coming year from Caliente north, across Connors Pass, to connect with a road which is being maintained by the county and State for a distance of about eighteen miles south of Ely.

There is rapidly developing between Ely and Caliente, which is a station on the Union Pacific line, freight and passenger service which will make this road a main artery.

Route No. 8 has received some attention from Humboldt County, the Department of Highways and the Federal Government, and the section from Winnemucca to Paradise Hill, which was completed last biennium, has been maintained to a very high standard, but additional funds have not been forthcoming for the completion of this section from Paradise Hill north to McDermitt, on the Oregon line.

There is a large amount of travel being developed between Yosemite National Park and Yellowstone National Park, which contemplates the use of the highway between Wells, through Contact, to Twin Falls, Idaho. This makes it necessary that Route No. 13 receive early attention in order that this traffic may be accommodated. This route was also a route which could not be included in the Federal aid system, and if work is done upon it it will have to be from funds supplied by the State and Elko County.

As the east and west routes have been nearing completion, attention has been directed to the north and south routes. Route 8-A, from Battle Mountain, through Austin, to Tonopah is rapidly forcing itself into the situation, so that additional effort will have to be made to make this road safer for travel. In Lander County, through the cooperation of the Board of County Commissioners and the State Highway Department, a short section south of Battle Mountain has been improved, so as to eliminate a very bad flat near that town. On this same route, north of Tonopah, a very bad sand stretch intervened between Tonopah and Manhattan, and work is now complete across this sand stretch, making it a most serviceable section of highway.

With all the 1,297.11 miles of highway which are now complete or under construction, we wish to call your attention to the large mileage still uncompleted. The highway problem of Nevada is one which needs earnest consideration during the next biennium in order that sufficient mileage may be constructed to complete the Federal aid system, and thus make it possible for other important roads, now badly needed, to be added to the Federal aid system and constructed in the future.

There is a thorough understanding with regard to the Federal aid law that the mileage designated for Federal aid, which amounts to seven per cent of the total mileage of the State, must be complete before any additions are made to the system, the object being to get through-highways, connecting one State with the other, and each county seat with the other county seat, completed as rapidly as possible, and the first Federal aid mileage was selected with this in view.

The object of the Department of Highways has been to develop within the State, as rapidly as possible, highways joining one community with another, in order that our people may be drawn closer together and enjoy the benefits of such social relationships as are possible through good highways, and at the same time extend the hand of greeting to our neighboring States in order that full benefit may be secured from the expenditures which they are making or have made just beyond our State boundaries.

During the past biennium the funds for highway construction have been supplied from the following sources: The two cent property tax; a four cent gasoline tax, two cents of which is placed in the State Highway Fund and the other two cents in the County-State Highway Fund in each county; the remainder of the automobile license fees after general interest and redemption costs have been paid on the \$1,000,000 bond issue for highway purposes; and such other monies as the various counties have contributed from their general funds in order that highway construction may more rapidly progress in those counties.

These funds, together with the Federal aid, have made possible the road building program which has been carried on through the past two

years, and represent an expenditure through the financial channels of the State of approximately \$4,555,000.

There has been a very rapid increase in travel in the State and our highways are being used more and more for transcontinental purposes.

Recently, in order to determine future highway construction, and also to see to what extent the public is using the highways, a traffic census was taken and some very startling results were obtained. With a registration of something over twenty thousand cars within the State, we found there was a movement over our highways, passing the various checking stations in the State, of 17,000 vehicles per day. This check of vehicles was taken only upon the main highways. At the various State boundaries a more detailed check was taken of traffic entering the State from other States, and of 4,131 foreign cars we found that 1,523 of these were headed east into Utah; 386 were going north to Idaho and Oregon; 1,782 were going to California; 151 were expecting to enter Arizona; and 288 were cars whose destination was the State of Nevada. We also discovered that twenty-five per cent of the cars using our main highways were cars from without our boundaries.

Upon questioning we found, much to our gratification, that the traveling public does not consider Nevada the barrier to travel that it was some six or seven years ago.

As construction increases and the number of miles are extended, the maintenance problem rapidly comes to the front, and the maintenance organization of the Department of Highways is continually being increased as new construction is added to the system. It will not be many years until we will have reached a stage where the present revenues will be required for highway maintenance, and when such a stage is reached construction will have to be reduced to a minimum; and it is quite possible that readjustments of the Federal aid conditions will be made before that time is reached. As matters now stand, it requires approximately \$300 per mile to maintain State highways, and the major portion of the revenue for State maintenance comes from the gasoline tax.

The type of surfacing which we are maintaining is such that, in the majority of cases, it handles the traffic it is expected to carry in a very satisfactory manner. Where the traffic is heavy, as between Carson City and Reno, Reno and the State line, Reno and Sparks, and in many of the smaller towns where traffic is centered on the main streets, which main streets are a part of the State highways, a fairly permanent type of pavement has been constructed, either Portland cement concrete or asphaltic cement concrete. The remaining portions of the highways have been constructed of native gravel and results so far indicate that this will be a fairly satisfactory roadway.

Investigations are now going on as to the possibility of removing the dust menace on these highways so that a larger number of vehicles may travel thereon, permitting the vehicles to be closer than a quarter of a mile apart and ride in comfort. It is possible that this problem will be solved during the coming year and a great deal of relief given the traveling public by such a solution.

For your general information we wish to submit the following legislative recommendations:

First—That sufficient funds be supplied for completing the seven per cent system now approved by the Federal Government at as early a date as possible, in order that other highways which are rapidly developing in importance may be added to the Federal aid system and Federal aid be received for their construction.

Second—By Act of Legislature certain members of the Department of Highways are available for enforcement of the Motor Vehicle Law, and the Department of Highways has had the problem of seeing the Motor Vehicle License Act enforced. We very much feel that this enforcement of the license Act is a subject foreign to highway construction, and would like to be relieved of that duty if legislative enactment can be made to properly take care of this particular form of enforcement.

While enforcing the collection of license fees, various phases of the Motor Vehicle Act have come to our attention, and we would like to recommend that the present forty-five mile speed limit be stricken from the statutes and that the speed limit be "safe and sane driving." On numerous occasions careless and irresponsible drivers have been the means of injury to property and possibly death of citizens, and difficulty has been met in enforcing the existing statute due to the fact the careless and irresponsible driver was going at a speed less than forty-five miles per hour, the legal limit.

Also, there seems to be a lack of uniformity in various localities as to what should be uniform code of operation of vehicles, and we would like to submit for your consideration that a uniform vehicle code is needed and, as we have such a large number of foreign travelers within our State, this should be a uniform vehicle code as similar to that which the other States are using as would be applicable to our State, and thus make traveling for our visitors more pleasant, and not have the traveler stand in fear of arrest for performing an act in this State which is a legal act in his own State.

Following are several tables and maps, which more clearly set forth the facts and problems relative to the State Highway Department's operations, and we most respectfully call these tables to your attention and consideration:

STATEMENT OF RECEIPTS

<i>Class of income</i>	<i>Paid 1917-1926</i>	<i>Pending</i>	<i>Grand Total</i>	<i>Percentage</i>
Législative appropriation	\$40,000.00		\$40,000.00	.26
Taxes, net amount received	1,224,352.48		1,224,352.48	7.76
Automobile license fees	503,149.82		503,149.82	3.19
Gasoline tax fees	446,538.76		446,538.76	2.83
Racing commission fees	110,691.24		110,691.24	.70
Miscellaneous refunds	9,029.25		9,029.25	.06
Sales and service (interdepartment)	700,794.19		700,794.19	4.44
Right of way refunds	6,076.78		6,076.78	.04
State highway bonds	900,000.00		900,000.00	5.70
Federal construction refunds	7,933,135.27	\$190,662.71	8,123,797.98	51.48
County construction refunds	2,883,875.93	17,123.27	2,900,999.20	18.38
County maintenance refunds	39,386.92	2,166.46	41,553.38	.26
Lincoln Highway Association	71,426.60		71,426.60	.45
Utah-Nevada-California Association	23,831.47		23,831.47	.15
City construction refunds	136,491.07	6,278.95	142,770.02	.91
Railroad crossing construction refunds	98,198.55	36,000.00	134,198.55	.85
Special maintenance deposits	2,000.00		2,000.00	.01
Accounts receivable	374,533.30		374,533.30	2.37
Lahontan plant depreciation	24,397.90		24,397.90	.16
Totals	\$15,527,909.53	\$252,231.39	\$15,780,140.92	100.00

STATEMENT OF DISBURSEMENTS

<i>Classification</i>	<i>1917 to 1924</i>	<i>1925 and 1926</i>	<i>Total</i>	<i>Percentage</i>
ASSET ACCOUNTS				
Highway construction	\$8,476,398.51	\$3,394,540.85	\$11,870,939.36	77.10
County maintenance		37,220.46	37,220.46	.24
Surveys, plans and preliminary eng.....	462,059.15	116,713.73	578,772.88	3.76
Plant inventories	100,323.55		100,323.55	.65
Equipment inventory accounts.....	309,209.74	22,676.39	331,886.13	2.15
Reno plant	272,360.05	186,819.17	459,179.22	2.98
Lahontan plant	19,321.35	350.00	19,671.35	.13
Accounts receivable	309,564.07	49,847.12	359,411.19	2.33
Section 31 refunds and spec. transfers...	40,107.17		40,107.17	.26
Hafed plant	1,560.86		1,560.86	.01
Vista plant		26,844.79	26,844.79	.18
EXPENSE ACCOUNTS				
General administration	433,470.32	194,493.02	627,963.34	4.09
Maintenance	419,160.19	523,614.14	942,774.33	6.12
Totals	\$10,843,534.96	\$4,553,119.67	\$15,396,654.63	100.00
To balance—Invested capital			383,486.29	
Grand total			\$15,780,140.92	

ESTIMATED BOND REDEMPTION

(As prepared November 30, 1926)

<i>Year</i>	<i>Redemption of principal each year</i>	<i>Interest payments</i>	<i>Estimated license receipts</i>	<i>Estimated balance available</i>
1920.....	\$90,000.00	\$654.15	\$103,758.58	.....
1921.....	100,000.00	29,126.99	102,410.32	.....
1922.....	60,000.00	17,920.48	120,944.38	\$29,405.01
1923.....		42,660.00	153,888.10	111,228.10
1924.....		25,640.00	181,969.85	156,329.85
1925.....	50,000.00	32,569.40	209,231.02	126,661.62
1926.....	100,000.00	31,750.00	210,000.00	78,250.00
1927.....	50,000.00	29,000.00	210,000.00	131,000.00
1928.....	100,000.00	26,000.00	210,000.00	84,000.00
1929.....	150,000.00	20,000.00	210,000.00	40,000.00
1930.....	100,000.00	11,000.00	210,000.00	99,000.00
1931.....	100,000.00	5,000.00	210,000.00	105,000.00
Total bonds issued.....			\$900,000	
Total authorized by Legislature.....			1,000,000	

CONSTRUCTION PROGRESS

Highways

The following table shows the status of construction on the State Highway System. Included in the table are 89.08 miles of highway constructed by the United States Bureau of Public Roads under the Federal Highway Act, and paid for from Federal Forest Highway Funds. Of the above total mileage of forest highways 19.35 miles were constructed and 17.25 miles of previously graded roadway were gravel surfaced during this biennium. Forest highway projects constructed during the past two years are:

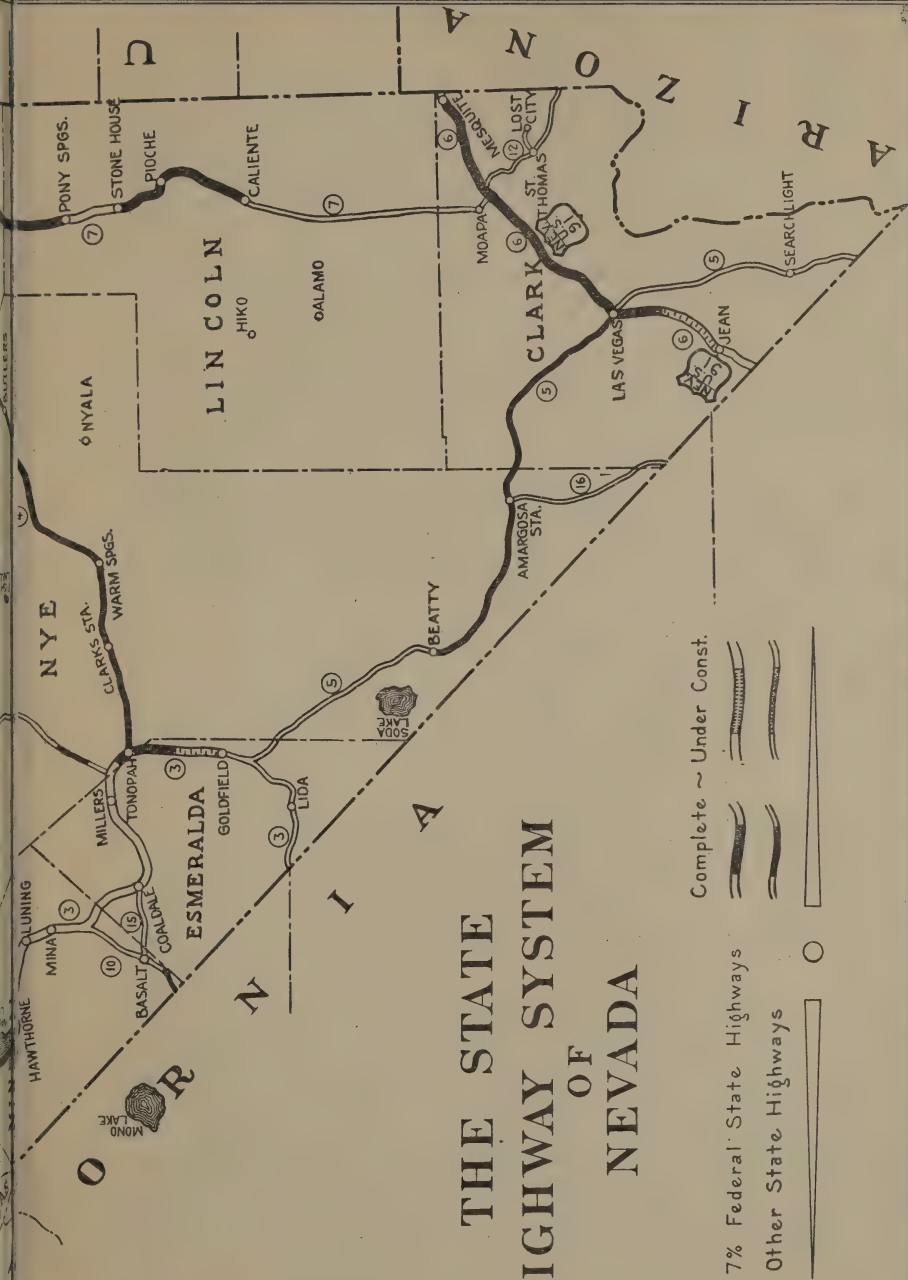
1. Gravel surface constructed on Route No. 2, from Railroad Pass to Nevada Central Railroad, 17.25 miles.

2. Grade and gravel surface constructed on Route 2, from Nevada Central Railroad to Austin Cemetery, 2.2 miles.

3. Grade and gravel surface constructed on Route 2, from 7.45 miles west of the Eureka-Lander County line to 9.70 miles east of the county line, 17.15 miles.



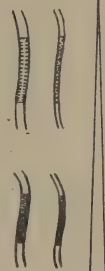
THE STATE HIGHWAY SYSTEM OF NEVADA



Complete ~ Under Const.

7% Federal State Highways

Other State Highways



Mileage Complete and Under Contract

<i>Type of construction</i>	<i>Miles com- pleted 1917-1924</i>	<i>Miles com- pleted 1925-1926</i>	<i>Miles com- plete to date</i>	<i>Miles under con- struction</i>	<i>Total miles</i>
Grading only	178.37	112.45	233.23	.....	233.23
Grading and gravel, shale or crushed rock.....	510.23	357.41	924.56	56.12	980.68
Grading and asphalt macadam surface.....	24.01	.....	24.01	.....	24.01
Grading and asphalt concrete surface.....	1.59	0.37	1.96	.....	1.96
Grading and cement concrete surface.....	45.09	0.31	47.07	.....	47.07
Road oil-sand surface.....	10.16	.....	10.16	.....	10.16
Gravel surface, projects previously graded.....	.....	*56.92	.....	.....	.....
Cement concrete, projects previously graded.....	.....	*1.67	.....	.....	.....
Totals	769.45	529.13	1,239.99	56.12	1,297.11

*Under column headed "Miles Complete to Date," these miles are included in "Grading and Gravel" and "Grading and Cement Concrete" respectively. The miles of "Grading Only" are reduced to correspond.

Bridges

Drainage structures having a span or distance between abutments of more than twenty feet are classified as bridges. Minor structures with spans of twenty feet or less are considered as culverts and are usually included as part of the roadway contract.

During the past biennium two reinforced concrete arch bridges were constructed over the Truckee River near Verdi, and one reinforced multiple span girder bridge was constructed over the same river at Wadsworth. A reinforced concrete girder bridge was constructed over the Simpson Canal near Wellington and a steel plate girder bridge over the Truckee Power Company's main canal in Verdi.

Bridges of More than 20 Feet Clear Span

<i>Type of construction</i>	<i>Completed 1917-1924</i>		<i>Completed 1925-1926</i>		<i>Totals</i>	
	<i>No.</i>	<i>Length</i>	<i>No.</i>	<i>Length</i>	<i>No.</i>	<i>Length</i>
Reinforced concrete	13	1,063	4	646	17	1,709
Structural steel	3	453	1	75	4	528
Timber bridge and trestle.....	5	1,920	.....	.....	5	1,920
Totals	21	3,436	5	721	26	4,157

ELIMINATION OF RAILROAD GRADE CROSSINGS

Crossings of railroads and highways at grade are a source of constant danger, and in the location and construction of the State Highway System most of these crossings are being eliminated. The Department has received splendid cooperation and financial assistance from the railroads in this work.

In 1917 there were thirty-one grade crossings on Route 1 of the State Highway System, where the old road crossed the Southern Pacific and Western Pacific tracks. Twenty of these crossings have been eliminated, seven by overhead or underpass structures and thirteen by adopting a new location for the highway to avoid crossing the railroad. Four other unusually dangerous crossings are now being eliminated in the Truckee River canyon, between Hafed and Wadsworth, by constructing the highway entirely north of the railroad. Two more, between Fernley and Lovelock, are planned for elimination in 1927. Thus we will have eliminated all but five of the grade crossings on this route.

Route 6 crosses the Union Pacific Railroad main line three times between the Arizona line and the California line in Clark County. The

railroad and highway grades are separated at two of these crossings by underpasses and the third, a grade crossing, is being eliminated by an overhead structure carrying the highway over the railroad.

Many grade crossings with other railroads have been eliminated in the course of State highway construction in Nevada. Prior to the 1925-1926 biennium the seven dangerous crossings of the Nevada Northern Railroad between Ely and Ruth, and all but three of the crossings with the Virginia and Truckee Railroad between Reno and Carson City were eliminated.

Three structures have been constructed during this biennium to eliminate grade crossings. These are:

Winnemucca Underpass, crossing Southern Pacific Railroad.

Fernley Underpass, crossing Southern Pacific Railroad.

Silver Zone Underpass, crossing Western Pacific Railroad.

STATUS OF STATE HIGHWAY CONSTRUCTION IN THE VARIOUS COUNTIES

Churchill County

During this biennium the following highways on the State Highway System have been completed or placed under construction on Route 2:

2 miles of grading were completed between Eastgate and the Lander County line, completing the extremely heavy construction at this point which was started in 1924.

10.24 miles of graded and gravel surfaced highway were completed between Westgate and Eastgate.

5.08 miles of previously graded roadway were surfaced with gravel between a point 5 miles south of Fallon and Grimes Ranch.

7.78 miles of graded and gravel surfaced highway were completed between Frenchmans Station and Westgate.

6.54 miles of graded and gravel surfaced highway between Sand Springs and Frenchmans Station are under construction and should be completed early in the summer of 1927. When this section is finished, Route 2 will be completed across the county.

Clark County

The following mileage on State Highway Route No. 6 has been completed or is under construction during this biennium:

7.96 miles of grading and 9.63 miles of graded and gravel surfaced highway have been completed between the Mormon Mesa and the Nevada-Arizona state line.

16.02 miles of graded and gravel surfaced highway have been completed between the West Slope of the Mormon Mesa and the East Slope of the Mormon Mesa.

1.61 miles of graded and gravel surfaced highway and 0.37 miles of asphaltic concrete have been completed in the city of Las Vegas.

13.89 miles of graded and gravel surfaced highway have been completed between Bard and Las Vegas.

16.25 miles of graded and gravel surfaced highway are now under construction between Jean and Bard and should be completed before the extremely hot weather sets in next summer.

On Route No. 5, 13 miles of grading were completed between Tule and Owens, the work being done by State and county cooperation, with-

out Federal aid. The completion of this section now gives a good highway between Las Vegas and the north Clark County line.

Douglas County

During this biennium the following mileage has been completed on State Highway Route No. 3:

13.96 miles have been graded and gravel surfaced between the east Douglas County line and a point 3 miles north of Holbrook. The completion of this section eliminates the very rough portion of old county road between the Summit north of Holbrook and the east county line.

Elko County

The following mileage has been completed on State Highway Route No. 1 during this biennium:

60.28 miles of graded and gravel surfaced highway and 0.49 miles of graded roadway have been completed between Wells and the east Elko County line. In connection with this work a concrete and steel underpass of the Western Pacific Railroad was constructed at Cliffside, Silver Zone.

Route No. 1 is entirely completed across the county.

Esmeralda County

On Route No. 3 the following mileage of State highway has been placed under construction during this biennium:

15.76 miles of graded and gravel surfaced highway are now under construction between Goldfield and Millers cut-off road. This construction should be completed during the summer of 1927 and there will then be a good surfaced highway between Goldfield and Tonopah.

Eureka County

On Route No. 2 the following mileage of state highway has been completed during this biennium:

10.16 miles of graded and gravel surfaced highway have been completed between the city of Eureka and the east county line.

0.55 miles of graded and gravel surfaced highway have been completed through the city of Eureka.

13.83 miles of graded and gravel surfaced highway have been completed between Hay Ranch and a point 14 miles west thereof.

The United States Bureau of Public Roads, using Forest Highway Funds, have completed 9.70 miles of graded and gravel surfaced highway between a point 14 miles west of Hay Ranch and the west Eureka County line.

Route No. 2 is now completed across the county.

On Route No. 1, 22.45 miles of graded and gravel surfaced highway have been completed between Dunphy and the east county line.

Route No. 1 is also completed across the county.

Humboldt County

The following mileage has been completed on State Highway Route No. 1 during this biennium:

1.5 miles of graded and gravel surfaced highway have been completed in the city of Winnemucca.

33.9 miles of graded and gravel surfaced highway have been completed between Winnemucca and Stone House and a concrete and steel underpass of the Southern Pacific Railroad Company's tracks at Winnemucca has been constructed.

Route No. 1 is completed across Humboldt County.

Lander County

The following mileage has been completed on State Highway Route No. 1 during this biennium:

19.67 miles of graded and gravel surfaced highway were completed between Battle Mountain and the east county line.

0.31 miles of cement concrete pavement were constructed through the city of Battle Mountain.

Route No. 1 is now entirely completed across the county.

On Route No. 2, 1.5 miles of graded and gravel surfaced highway were completed through the city of Austin.

The United States Bureau of Public Roads, using Forest Highway Funds, completed 7.45 miles of graded and gravel surfaced highway between Grimes Ranch and the east county line.

They also constructed 2.2 miles of graded and gravel surfaced highway between Austin and a point 2.2 miles west, and surfaced with gravel 17.25 miles of previously graded roadway between this last point and Railroad Pass.

Route No. 2 is completed across the county.

On Route No. 8-A, 4.60 miles of graded and gravel surfaced highway were completed between the Jenkins Ranch and a point approximately 5 miles south. This work was done by State and county cooperation without Federal aid.

Route No. 8, in Lander County, now has 13.6 miles of completed highway between Battle Mountain and Austin.

Lincoln County

The following mileage has been completed on State Highway Route No. 7 during this biennium:

15.48 miles of graded and gravel surfaced highway were completed between Dutch Johns and the north county line.

With the exception of 15.74 miles through the Cedars, Route No. 7 is now completed between Caliente and the north county line.

Lyon County

The following work has been completed or placed under construction on Routes 1 and 2 during this biennium:

A concrete and steel underpass of the Southern Pacific Railroad Company's tracks was constructed just west of Fernley.

2.76 miles of graded and gravel surfaced highway is now under construction between Fernley and a point 2.76 miles east.

Upon the completion of this section, Route No. 2 will be completed across the county.

On Route No. 3, 9.60 miles of gravel surfaced highway were completed between Yerington and a point 9.60 miles easterly toward Schurz.

5.72 miles of graded and gravel surfaced highway were completed

from Smiths Corners through Wellington to the west county line. In connection with this work a two span concrete girder bridge 44 feet long was constructed over the Simpson Canal at a point approximately a mile and a half west of Wellington.

Mineral County

The following mileage has been completed on State Highway Route No. 10 during this biennium:

The State and county cooperating, and without Federal aid, have completed 3 miles of graded road near the summit of Montgomery Pass.

Nye County

The following mileage has been completed on State Highway Route No. 4 during this biennium:

The State and county cooperating have constructed a graded highway between Warm Springs and Lockes Ranch, and have also surfaced with crushed rock 5.0 miles of previously graded roadway on the east slope of the Currant Creek Summit.

Route No. 4 is now in splendid condition from Tonopah to the east county line.

On Route No. 3, 1.55 miles of graded and graveled road were completed between the west side of Tonopah and the west county line, and on Route 8-A, 9.21 miles of graded and gravel surfaced highway were completed between a point 8 miles North of Tonopah and 30 miles south of Manhattan.

The last two sections were also constructed by the State and county cooperating, and without Federal aid.

Pershing County

The following mileage has been completed on State Highway Route No. 1 during this biennium:

5 miles of graded and gravel surfaced highway were completed between Mill City and the east county line.

With the exception of 19 miles between Lovelock and the Churchill County line, Route No. 1 is completed across the county.

Storey County

The 1925 Legislature added another route to the State Highway System, designated as No. 17. This route begins at a point on Route No. 3 approximately 10 miles south of Reno, running through Virginia City, Gold Hill, and Silver City to a connection with Route 2-A near Mound House. 5.4 miles of this route were graded and surfaced with crushed rock, from Virginia City northerly to the Washoe County line, making a splendid mountain road and eliminating a number of sharp and dangerous curves which occurred on the old county road.

Washoe County

On Route No. 1 the following work has been completed or placed under construction during this biennium:

5.62 miles of graded road were completed between the Nevada-California state line and a point 2 miles east of Verdi. Of this, 1.67 miles between Verdi and the easterly end of this section have been paved with cement concrete 18 feet wide.

A reinforced concrete arch bridge 141 feet long was built across the Truckee River just east of Verdi.

A 75 foot steel girder bridge was built across the Truckee Power Company's main canal in the town of Verdi and a reinforced concrete arch bridge 193 feet long was constructed across the Truckee River immediately west of Verdi.

The 2.55 miles of 9 foot pavement which was constructed in 1924 from a point 2 miles east of Verdi and a point just west of Lawton Springs was widened to 18 feet during this biennium.

7.57 miles were graded and surfaced with crushed rock between Sparks and Hafed.

0.69 miles were graded and graveled between Wadsworth and three-fourth miles east. In connection with this work a reinforced concrete girder bridge 268 feet long was constructed across the Truckee River at Wadsworth.

14.81 miles of grading and surfacing with crushed rock are now under construction between Hafed and Derby. This work should be completed early in 1927. The completion of this project will eliminate all the dangerous railroad crossings in the Truckee River Canyon between Sparks and Wadsworth.

Route No. 1 is now complete or under construction across Washoe County. The section between Verdi and the California line is to be paved in 1927, which will provide a paved highway on Route No. 1 from the California state line to the east city limits of Sparks.

White Pine County

The following mileage has been completed on State Highway Route No. 2 during this biennium:

13.65 miles of graded and gravel surfaced highway were constructed between the west county line and Pancake Summit.

12.21 miles of graded and gravel surfaced highway were completed between Ely and McGill.

The state and county cooperating also constructed 7.01 miles of graded and gravel surfaced highway between McGill and a point 7 miles north.

5.91 miles of previously graded roadway were surfaced with gravel at Robinson Summit.

On Route No. 7, 27.08 miles of graded and gravel surface highway were completed between the south county line and Connors Pass.

MAINTENANCE

The maintenance of constructed highways is an important phase of the State Highway Department's activities. From the very beginning ample provision for adequate maintenance was made, and an efficient and economical system of maintenance was developed. As the mileage of completed highways has grown, improvements have been made in maintenance methods. Economics have been introduced which enable the rendering of the best possible service to the public, and, at the same time, protect the original investment in highways at a minimum annual expenditure.

Thus, for an annual expenditure very small in comparison to the construction costs, the Department has been able to keep the con-

TABLE SHOWING MILEAGE COMPLETED, UNDER CONSTRUCTION, AND UNIMPROVED ON THE FEDERAL AID SEVEN PER CENT SYSTEM, STATE HIGHWAYS NOT ON SEVEN PER CENT SYSTEM AND ENTIRE STATE HIGHWAY SYSTEM

Counties	Federal Aid 7% System			State Highways not on 7% System			Entire State Highway System		
	Completed and under construction	Unimproved	Totals	Completed and under construction	Unimproved	Totals	Completed and under construction	Unimproved	Totals
Churchill	87.36	42.76	130.12	-----	63.00	63.00	87.36	105.76	193.12
Clark	111.80	17.41	129.21	49.90	154.50	204.40	161.70	171.91	333.61
Douglas	28.32	26.42	54.74	-----	-----	-----	28.32	26.42	54.74
Elko	140.31	-----	140.31	-----	229.00	229.00	140.31	229.00	369.31
Esmeralda	25.46	99.23	124.69	-----	29.05	29.05	25.46	128.28	153.74
Eureka	72.70	-----	72.70	-----	-----	-----	72.70	-----	72.70
Humboldt	84.69	-----	84.69	-----	134.00	134.00	84.69	134.00	218.69
Lander	106.83	-----	106.83	13.60	-----	13.60	120.43	98.40	218.83
Lincoln	38.62	15.74	54.36	-----	102.39	102.39	38.62	118.13	156.75
Lyon	64.72	36.17	100.89	-----	46.00	46.00	64.72	82.17	146.89
Mineral	*35.56	63.94	99.50	6.00	39.32	45.32	41.56	103.26	144.82
Nye	1.55	1.33	2.88	142.71	228.57	371.28	144.26	229.90	374.16
Ormsby	4.51	15.84	20.35	-----	-----	-----	4.51	15.84	20.35
Pershing	58.17	18.20	76.37	-----	-----	-----	58.17	18.20	76.37
Storey	5.40	-----	5.40	-----	3.88	3.88	5.40	3.88	9.28
Washoe	90.14	7.23	97.37	-----	35.00	35.00	90.14	42.23	132.37
White Pine	116.53	103.64	220.17	12.23	89.03	101.26	128.76	192.67	321.43
Totals	1,072.67	447.91	1,520.58	224.44	1,252.14	1,476.58	1,297.11	1,700.00	2,997.16

*24.50 miles between Schurz and Hawthorne constructed by State and county cooperation without Federal aid and must be improved to a higher standard to meet Federal aid requirements.

structed roads in excellent condition, and also to fulfill the obligation of the State of Nevada to the Federal Government, for in accepting Federal participation in construction costs, the State also accepted the obligation of maintaining satisfactorily the constructed projects.

The United States Bureau of Public Roads, which has final supervision over completed highways and which defines the standards of maintenance work, has never had occasion to criticize the condition of any section of the Nevada Highway System or to invoke the prerogatives of the Bureau in respect to Nevada's maintenance. The biennium ends with every mile of highway constructed with Federal aid, or otherwise, in a very satisfactory condition.

During the year 1925 the Department expended for the maintenance of improved and semi-improved highways \$215,168.70; and for the year 1926, \$306,899.52.

Gravel

Gravel road maintenance costs for the biennial period were as follows:

	1925	1926
Total cost	\$121,544.68	\$192,676.41
Miles maintained	390.71	649.8
Cost per mile	\$311.08	\$296.52

Concrete

Concrete surfaced highway costs for the years 1925 and 1926 were as follows:

	1925	1926
Total cost	\$17,196.66	\$20,340.87
Miles maintained	42.8	42.8
Cost per mile	\$401.79	\$475.25

The increase in maintenance costs for 1926 over the costs during 1925 should not be ascribed as to the deterioration of the concrete pavement built by the Department, for such is not the case. The increase resulted from expenditures made for surfacing the earth shoulders at the sides of the pavement.

Oiled Sand

Several years ago the Department constructed ten miles of oiled sand-surfaced roadway in the vicinity of Beatty through almost impassable desert sand. The oiled surface has proved to be a solution of the difficulty of building a satisfactory road under such unfavorable conditions. The annual maintenance costs of this project are comparatively low. The costs for the biennial period were as follows:

	1925	1926
Total cost	\$620.10	\$704.21
Miles maintained	10	10
Average cost	\$62.01	\$70.42

Unsurfaced Earth

The maintenance costs of unsurfaced-earth roads during the biennial period were as follows:

	1925	1926
Total cost	\$11,979.36	\$16,410.62
Miles maintained	45.50	51.24
Average cost	\$263.28	\$320.27

Asphalt Macadam

The costs of maintaining asphalt-macadam-surfaced highway during the biennial period were as follows:

	1925	1926
Total cost	\$6,909.64	\$8,134.99
Miles maintained	20.56	20.56
Average cost	\$336.07	\$395.67

Federal Aid Projects Completed During Year

Under this classification all projects having a partial year's maintenance are carried. The tabulation does not reveal any significant fact—the classification is for accounting purposes only.

	1925	1926
Total cost	\$6,529.59	\$4,090.15
Miles maintained	288.78	241.13

Snow Removal

Due to abnormally light snowfall during the past two years the snow removal activities of the Department have been kept to a minimum. Expenditures carried under this classification are mostly for equipment renewals and alterations:

	1925	1926
Total cost	\$1,479.13	\$1,803.43

County-State Cooperative Projects

Under this classification is carried all the maintenance work on projects that have been built by the counties and the State without Federal participation. During the biennium the following amounts were expended for maintenance of county-state cooperative projects:

	1925	1926
Total cost	\$47,906.73	\$56,817.67
Miles maintained	387.29	431.99
Average cost	\$123.70	\$131.53

SUMMARY OF MAINTENANCE EXPENDITURES 1925 AND 1926

Class	1925			1926		
	Miles	Total cost	Cost per mile	Miles	Total cost	Cost per mile
<i>Federal Aid Projects Completed</i>						
Gravel	390.71	\$121,544.63	\$311.08	649.80	\$192,676.41	\$296.52
Concrete	42.80	17,196.66	401.79	42.80	20,340.87	475.25
Oil and sand	10.00	620.10	62.01	10.00	704.21	70.42
Earth	45.50	11,979.36	263.28	51.24	16,410.62	320.27
Selected material	7.04	1,002.81	142.45	7.04	3,267.75	464.17
Asphalt macadam	20.56	6,909.64	336.07	20.56	8,134.99	395.67
Totals	516.61	\$159,253.25	\$308.27	781.44	\$241,534.85	\$309.09
<i>Federal Aid Projects Completed During Year</i>						
Partial years maintenance only	288.78	6,529.59	-----	241.13	4,090.15	-----
Snow removal activities	28.50	1,479.13	51.90	54.86	1,803.43	32.87
Removing nails from highways	-----	-----	-----	-----	2,653.42	-----
<i>County-State Cooperative Projects</i>						
Gravel, earth and unimproved	387.29	47,906.73	123.70	431.99	56,817.67	131.53
Total expenditures	1,221.18	\$215,163.70	-----	1,509.42	\$306,899.52	-----



